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SOURCE Rybnoye Khozyaystvo, No 8, 10, 1949.

COMMERCIAL FISH IN LAKE BALKHASH

Lake Balkhash, one of the largest lakes in the USSR, has comparatively few fish resources. Only the following seven varieties of fish are found in it: small sturgeon (*Acipenser nudiventris* Lov.), carp (*Cyprinus carpio* L.), Balkhash marinka (*Schizothorax argentatus* Kessl.), Iliyskaya marinka (*Sch. pseudakaisiensis* Herz.), two types of fish called gubach (*Diplophysa strauchi* Kessl. and *D. labiata* Kessl.), and the Balkhash perch (*Perca schrenki* Kessl.). Of these, the carp, Balkhash marinka, and perch are the only commercially useful fish. The last two varieties are least valuable because of their slow rate of growth and low value. Therefore, it is planned to stock the lake with new varieties of commercial fish. (1) /Numbers in parentheses refer to appended sources. 7

Existing Fish Resources

Carp and perch are plentiful in Western Balkhash while marinka are found in large numbers in Eastern Balkhash. Carp, lake marinka, and pelagic perch do not undertake long spawning migrations, but go from deeper to more shallow pre-delta areas. River marinka, however, at times migrate a considerable distance up rivers to spawn.

1. Perch

The most important spawning area for perch is near the mouth of the Ili River and includes the three industrial areas of Usyak, Ir, and Sartumsuk. This area is wide and shallow with a soft, silt bottom and considerable marine plant life. Perch migration to spawning places begins under the ice during the middle or end of March. Large numbers of perch accumulate as the water in the littoral areas grows warmer. On some days, the average catch in one fixed net is as high as 47 kilograms, or one center.

Pelagic perch begin to spawn when the water temperature is about 10 degrees above zero centigrade and complete spawning when the temperature is 14-16 degrees. The catching of spawning perch in Western Balkhash usually begins during the first 5 days of April and continues to the end of April, or sometimes to the beginning of May. The perch usually spawn at a depth of 10-20 centimeters near the shore. In cold, stormy weather, perch spawning takes place farther from shore at a depth of 1-1.5 meters.

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Perch are caught primarily by fixed nets. According to Yarmolenko (1941), up to 63 percent of the perch in Lake Balkhash are caught by fixed nets and not over 37 percent by means of seines and other equipment. Small perch are caught most efficiently by means of scrapers.

2. Marinka

Balkhash marinka begin to migrate at nearly the same time, or sometimes earlier than perch. At the beginning of March, river marinka approach the pre-delta area of the Ili River where they are caught at the end of March in fixed nets. Catches at this time vary from 3 to 29 kilograms per fixed net per night. When the temperature is 4-6 degrees (usually during the first 5 days of April), marinka begin to migrate up the Ili River.

The largest catches of lake marinka in eastern Balkhash are found in the Ashche-Su area located near the mouth of the Karatal River. In general, catches of lake marinka are quite large, occasionally amounting to 26.5 centners per day.

River marinka are caught primarily by means of floating nets and lake marinka by seines designed for catching carp.

3. Carp

Carp begin to spawn later than the other varieties of fish. During the first half of April, the carp are still in the deeper areas of the lake. At this time, the lake is usually frozen and the fish are concentrated primarily in the lower part of the Ili River. At the end of April and the beginning of May, carp migrate in large quantities to the spawning grounds. The largest catches of carp are in May. The first spawning specimens of carp appear when the water temperature is 16-18 degrees.

The basic spawning ground for carp is the Ili River delta with its many lakes and tributaries which are almost entirely covered with marine life and floating and submerged plants. Spring catches in delta lakes in some years were as large as 10,000 centners. In addition to the Ili River delta, parts of the eastern and southern waters of the shallow Western Balkhash serve as spawning grounds for carp. The Eastern Balkhash does not have as large spawning grounds as the Western Balkhash.

Carp spawning is divided into two periods. During the first period, the catch is very large and in Western Balkhash usually ends during the first part of June. The second period is much longer, but the catch is not as large. The basic type of equipment used in the lake's river deltas and the Ili River channel are trap nets. They are not, however, found in Eastern Balkhash. The trap net catch is very large: the first catch averages 18 kilograms per month, and the second catch up to 87 kilograms per month. In the lake, the basic fishing equipment for carp is seines. Some carp fisheries in 1945 obtained as much as 115 centners of fish for the season.

During the past few years, the fish catch in Balkhash has grown smaller. However, there are no indications that the fish resources have decreased. On the contrary, catches of carp, perch, and marinka show an increased number of older fish.(2)

Stocking Efforts

Attempts to stock Lake Balkhash with whitefish, barbel and small sturgeon ended unsuccessfully. Experiments with Aral small sturgeon were somewhat more successful although sturgeon generally remain in the Ili River delta where they can find a more abundant supply of food.

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Past attempts at stocking Lake Balkhash indicate that a detailed biological analysis and hydrological study of the lake must precede stocking measures. The basic obstacle to the successful introduction into Lake Balkhash of new commercial fish varieties is the lack of food resources, primarily the very low supply of benthos.

Prior to introducing new varieties of fish into Lake Balkhash, the lake should be filled with predatory fish capable of crowding out the less valuable Balkhash perch. Pike perch, a valuable commercial fish, is suitable for that purpose. Caspian invertebrates might prove valuable in stocking Lake Balkhash. So might the Aral carp.

After the supply of benthos in Lake Balkhash is increased, it will be fully possible to stock the lake with several species of benthos-eating fish, among them bream.

Plant life is also a potential source of food for fish. However, little is known about plant varieties in the lake.

The following fish breeding remedial measures for Lake Balkhash should be put into effect for the next few years:

1. The quantity of perch in Lake Balkhash should be greatly reduced and finally exterminated by the more commercially valuable pike perch.
2. Plant food resources of the lake should be increased by stocking and acclimatizing new plant varieties.
3. Subsequent to the above measures, Lake Balkhash should be stocked with new varieties of commercial fish which can utilize both the animal and plant food resources of the lake to the best advantage.(1)

Sources

1. Rybnoye Khozyaystvo, No 10, Oct 1949
2. Rybnoye Khozyaystvo, No 8, Aug 1949

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